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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/686,189	10/14/2003	Steven J. Visco	PLUSP027	3774
22434 7590 04/11/2007 BEYER WEAVER LLP P.O. BOX 70250 OAKLAND, CA 94612-0250			EXAMINER CANTELMO, GREGG	
			ART UNIT	PAPER NUMBER
			1745	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		04/11/2007	PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/686,189	<b>Applicant(s)</b> VISCO ET AL.	
	<b>Examiner</b> Gregg Cantelmo	<b>Art Unit</b> 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 12 February 2007.  
 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-33 and 73-79 is/are pending in the application.  
 4a) Of the above claim(s) 18,19,21-24,26,27,29,31-33 and 74-76 is/are withdrawn from consideration.  
 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
 6) ☒ Claim(s) 1-17,20,25,28,30,73 and 77-79 is/are rejected.  
 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) ☐ All b) ☐ Some \* c) ☐ None of:  
 1. ☐ Certified copies of the priority documents have been received.  
 2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>SEE OFFICE ACTION</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Amendment***

1. In response to the amendment received February 12, 2007:
  - a. Claims 1-33 and 73-79 are pending. Claims 34-72 have been cancelled as per Applicant's request. Claims 18, 19, 21-24, 26, 27, 29 and 31-33 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected inventions, there being no allowable generic or linking claim. Claims 74-76 are withdrawn from consideration as to non-elected species discussed in detail below. Action on the merits of claims 1-17, 20, 25, 28, 30, 73 and 77-79 follows.
  - b. The specification objection has been overcome in light of the amendment;
  - c. The claim objection has been overcome in light of the amendment to claims 3-4;
  - d. The 112 1<sup>st</sup> and 2<sup>nd</sup> paragraph rejections have been overcome in light of the amendment;
  - e. The prior art rejections of record are withdrawn in light of the amendment;
  - f. The statutory double-patenting rejection stands;
  - g. The obviousness-type double patenting rejections stand. However the obviousness-type double patenting to 10/772,228 is withdrawn since the claims in the instant application have been amended to differ in scope from that of 10/772,228. At this point in prosecution history, no amendment to claims 10/772,228 has been made and Applicant should be made aware that

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subsequent amendments to claims in 10/772,228 which provide amended limitations identical in scope or obvious over the limitations in the instant application will likely require reapplication of a double patenting rejection between these two applications.

***Election/Restrictions***

2. Newly submitted claims 74-76 and amended claims 18 and 19 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons:

As set forth in the previous office action the claims were directed to multiple species. While the elected species was not reasonably taught or suggested by the prior art of record, the species requirement is still applied to those remaining species set forth in the original office action. In the previous office action an alternate species was found to read on the claims which included a LiPON material in the composite structure. Thus only those claims including LiPON in the protective layers are considered to be directed to the pending elected species. All claim limitations to alternative species are withdrawn from consideration (including claims 18 and 19 and 74-76).

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 22-24 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

***Information Disclosure Statement***

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3. The information disclosure statements filed October 2, 2006 and March 6, 2007 have been placed in the application file and the information referred to therein has been considered as to the merits. Note that references which are crossed out on these information disclosure statements appear to have been previously cited on earlier filed information disclosure statements and thus have already been considered. The duplicate citations have been crossed out to prevent multiple listings of prior art references if the instant application matures into a U.S. patent.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

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under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-6, 8-12, 15-17, 20, 73 and 77-79 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,797,428 (Skotheim) (as evidenced by the enclosed property listing sheet for Lithium Phosphorous Oxynitride ("Lipon") Electrolyte properties) in view of U.S. Patent No. 5,648,187 (Skotheim '187).

Skotheim discloses an electrochemical device component comprising an active metal layer 10 and a variety of protective composite layers 30, 40, 31, 41, 42, 50 and 60 disposed atop the active metal layer 10 (see Figs). The first material in contact with active layer 10 includes a metal layer applied to the surface of the lithium active material (col. 14, line 62 through col. 15, line 3) which includes various materials including tin and copper (applied to claims 77-79) and in at least one embodiment a single-ion conductor layer (LiPON) and a second crosslinked polymer layer (see col. 15, ll. 3-10 and prior art claim 8), the crosslinked polymer layer is also an ion conducting layer as discussed below. As discussed, LiPON exhibits an ionic conductivity of at least  $10^{-7}$  S/cm (as applied to claim 1). LiPON is known to have an ionic conductivity of  $10^{-6}$  S/cm at 25 °C as evidenced by the enclosed data sheet for LiPON (Fig. 2 as applied to claims 1, 6 and 12).

In one embodiment, the anode further comprises a substrate, wherein the substrate is in contact with a surface of the first layer on the side opposite the second

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layer. In one embodiment, the substrate comprises a current collector (col. 2, ll. 57-67 as applied to claim 2).

Both the first and second layers disposed atop the metal layer of Skotheim are ionically conducting and thus embody an electrolyte (as applied to claim 3).

As to claim 4, claim 4 does not further limit claim 1. Claim 1 is directed to an electrochemical device component and not to a battery cell. The construct of the invention of claim 1 disposed in the cell, while limiting to the battery design, does not effectively limit the electrode device component of claim 1. Thus since this rejection obviated the invention of claim 1 and since claim 4 does not further limit the claimed device component, claim 4 is rendered obvious for the same reasons applied to claim 1, discussed herein.

The 3<sup>rd</sup> layer and 4<sup>th</sup> layer are provided at a thickness from 5-5000 nm (col. 3, ll. 1-42 as applied to claims 8-12).

The anode active material is lithium (abstract a3s applied to claims 15-17).

LiPON, a metal ion conductor, can be provided as either the first or second material as shown by the fact that Skotheim teaches of alternative combinations to the composite protective layer (as applied to claims 20).

As to claim 73, claim 73 only serves to define the metal nitride of claim 1 without positively requiring that the material of claim 1 be a metal nitride. When the limitations of claim 73 are read in the context of claim 1, the additional limitation of claim 73 only defines the metal nitride. Since Skotheim teaches of one of the other species in the genus of claim 1 and since claim 73 does not further define the remaining species apart

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from that of the metal nitride, Skotheim is held to teach of the limitations of claim 73 with respect those materials other than the metal nitride as discussed above. For a simpler explanation, see the following claim construct. Claim 1. A container comprising: a lid and a body wherein both the lid and the body are of a shape selected from the group comprising elliptical shapes and polygonal shapes. Claim 2. The container of claim 1, wherein the polygonal shape is a square. According to claim 1, the shapes can be elliptical shapes or polygonal shapes. According to claim 2, the shapes can be elliptical shapes or a square. Thus if the prior art reference teaches of elliptical shapes, the further definition of the polygonal shape is irrelevant since the prior art teaches the alternative elliptical shape.

In particular above, the intermediate metal layers discussed above are exemplary of a wetting layer between the anode active layer, which is lithium and the LiPON single-ion conductor.

While LiPON exhibits the claimed requisite ionic conductivity, Skotheim does not expressly teach of the polymer layer exhibiting the same requisite ionic conductivity (claims 1 and 5).

However Skotheim references U.S. Patent No. 5,648,187 (Skotheim '187) which teaches of using lithium ion conducting polymer layers for use in anodes. Thus these polymer layers are clearly ionically conductive. At least some of these materials are expected to exhibit lithium ionic conductivities of at least  $10^{-7}$  S/cm (claim 5).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Skotheim by selection the



polymer layers to be ionically conducting lithium polymers since it would have provided the requisite means for conducting ions from between the various layers separating the anode active material and electrolyte and cathode active material of Skotheim.

Furthermore it would have been obvious to select materials exhibiting ionic conductivities of at least  $10^{-7}$  S/cm and further between about  $10^{-6}$  S/cm to  $10^{-3}$  S/cm since it would have improved the ion mobility of the polymer layer and thus improved the electrochemical transport and activity of the battery. Generally, differences in ranges will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such ranges is critical. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969). It has been held that when the difference between a claimed invention and the prior art is the range or value of a particular variable, then a prima facie rejection is properly established when the difference in the range or value is minor. Titanium Metals Corp. of Am. v. Banner, 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985).

5. Claims 7, 13, 14, 20 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Skotheim (as evidenced by the enclosed property listing sheet for Lithium Phosphorous Oxynitride ("Lipon") Electrolyte properties) in view of Skotheim '187 as applied to claim 1 above in further view of U.S. Patent No. 6,485,622 (Fu).

The differences not yet discussed are '765 does not teach of the second material having an ionic conductivity between about  $10^{-3}$  S/cm (claim 7) or in a range between about  $10^{-4}$  S/cm and  $10^{-3}$  S/cm (claim 13), of the second material being the ion-

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conducting glass ceramic as defined in claims 20 and 28 or of the thickness being between about 10-500 microns (claim 13) or between about 10-100 microns (claim 14).

Fu teaches that the same lithium ion conductive glass-ceramic material is known in the art for use in lithium electrochemical cells (abstract as applied to claims 20 and 28). These materials include ionic conductivities of  $10^{-4}$  S/cm (Table 2),  $10^{-4}$  S/cm being held to be "about"  $10^{-3}$  S/cm (as applied to claim 7).

The composition has an increased ionic conductivity as well as enhanced thermal stability within electrochemical devices.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Skotheim by selecting the second material to be the lithium ion conductive glass-ceramic material taught by Fu since it would have provided a material which provided both protection to the anode as well as increased the ionic conductivity of the protection composite in the cell. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

As to the claimed thicknesses:

Skotheim teaches of each of the first and second layers of the composite multi-layer structure having a thickness from 0.5-10 microns (col. 4, ll. 33-36). Each of the two layers themselves is up to 5 microns (as discussed above and in col. 3 of Skotheim). The difference between 5 microns and the lower limit of about 10 microns of

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the claims are close in value, noting in particular that the term "about 10 microns" could potentially encompass 5 microns or smaller. The values of Skotheim are close to or potentially overlap at their endpoints. Furthermore there is no apparent criticality and unexpected results apparently associated with the larger thicknesses of claims 13 and 14. Generally, differences in ranges will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such ranges is critical. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969). It has been held that when the difference between a claimed invention and the prior art is the range or value of a particular variable, then a prima facie rejection is properly established when the difference in the range or value is minor. Titanium Metals Corp. of Am. v. Banner, 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985).

### ***Response to Arguments***

6. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

### ***Double Patenting***

A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in

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scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

7. Claims 1-7, 15-17, 20, 25, 28, 30, 73 and 77-79 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1-12, 14, 15, 21 and 25-27 of copending Application No. 10/731,771. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

Copending Application No. 10/731,771 claims an electrochemical device component, comprising: an active metal electrode having a first surface and a second surface; a protective composite on the first surface of the electrode, the composite comprising, a first material layer in contact with the electrode, the first material being ionically conductive and chemically compatible with the active metal, wherein the first material comprises a material selected from the group consisting of a composite reaction product of the active metal with a metal nitride, a composite reaction product of the active metal with silicon nitride, a composite reaction product of the active metal with a metal halide, a composite reaction product of the active metal with a metal phosphide, a reaction product of the active metal with red phosphorus, and a reaction product of the active metal with LiPON coated with a wetting layer; and a second material in contact with the first material, the second material being substantially impervious, ionically conductive and chemically compatible with the first material; wherein the ionic conductivity of the composite is at least  $10^{-7}$  S/cm (claim 1 as applied to instant claim 1). The elected species materials in both applications are identical in that the first material is the composite reaction product of lithium metal with  $\text{Cu}_3\text{N}$ , the second material is the ion conducting glass of claim 14 in the instant application and claim 28 of

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the copending application; and the active material is lithium. It is held that while the instant claims do not positively recite that the first material is a layer, in order for the composite to be formed on the electrode, the first material is inherently a layer (whether continuous or discontinuous) and thus the scope of the claims of each application are held to be coextensive and raises the issue of statutory double patenting. It is further maintained that the claimed and disclosed second material and active metal are inherently reactive. Thus the scope of the claims in Copending Application No. 10/731,771 is still held to be identical in scope and raises the issue of statutory double patenting.

The component further comprises a current collector on the second surface of the active metal electrode (claim 2 as applied to instant claim 2).

The second material comprises the sole electrolyte in a subsequently formed battery cell (claim 3 as applied to instant claim 3).

The subsequently formed battery cell further comprises an electrolyte (claim 4 as applied to instant claim 4).

The ionic conductivity of the second material is between about  $10^{-6}$  S/cm and  $10^{-3}$  S/cm (claim 5 as applied to instant claims 5 and 6).

The ionic conductivity of the second material is between about  $10^{-5}$  S/cm and  $10^{-4}$  S/cm (claim 6 as applied to instant claims 6 and 7).

The thickness ratio of the first material to the second material in the composite is less than 1-1000 (claim 7 as applied to instant claims 9-11).

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The active metal of the electrode is lithium (claim 8 as applied to instant claims 15-17).

The first material is the composite reaction product of lithium metal with  $\text{Cu}_3\text{N}$  (claims 9 and 10 as applied to instant claims 25 and 30).

The second material is identical in scope (claim 14 as applied to instant claims 20 and 28).

The metal nitride is copper nitride (claim 21 as applied to claim 73).

The first material comprises a material selected from the group consisting of a reaction product of Li with LiPON coated with a wetting layer (claim 25 as applied to claim 77).

The wetting layer coating is Ag (claim 26 as applied to claim 78).

The wetting layer coating is Sn (claim 27 as applied to claim 79).

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

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Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8. Claims 1-17, 20, 25, 28, 30, 73 and 77-79 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims and 1-12, 14, 15, 21 and 25-27 of copending Application No. 10/731,771.

Although the conflicting claims are not identical, they are not patentably distinct from each other.

Copending Application No. 10/731,771 claims an electrochemical device component, comprising: an active metal electrode having a first surface and a second surface; a protective composite on the first surface of the electrode, the composite comprising, a first material layer in contact with the electrode, the first material being ionically conductive and chemically compatible with the active metal, wherein the first material comprises a material selected from the group consisting of a composite reaction product of the active metal with a metal nitride, a composite reaction product of the active metal with silicon nitride, a composite reaction product of the active metal with a metal halide, a composite reaction product of the active metal with a metal phosphide, a reaction product of the active metal with red phosphorus, and a reaction product of the active metal with LiPON coated with a wetting layer; and a second material in contact with the first material, the second material being substantially impervious, ionically conductive and chemically compatible with the first material; wherein the ionic conductivity of the composite is at least  $10^{-7}$  S/cm (claim 1 as applied to instant claim 1). The elected species materials in both applications are identical in that the first material is the composite reaction product of lithium metal with  $\text{Cu}_3\text{N}$ , the second

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material is the ion conducting glass of claim 14 in the instant application and claim 28 of the copending application; and the active material is lithium. It is further maintained that the claimed and disclosed second material and active metal are inherently reactive.

Claim 1 of copending Application No. 10/731,771 differs from claim 1 of the instant application only in the recitation of the first material being a first material layer and in the event that the structure of the claims are in fact distinguishable from one another the claims would further be obvious over one another.

The component further comprises a current collector on the second surface of the active metal electrode (claim 2 as applied to instant claim 2).

The second material comprises the sole electrolyte in a subsequently formed battery cell (claim 3 as applied to instant claim 3).

The subsequently formed battery cell further comprises an electrolyte (claim 4 as applied to instant claim 4).

The ionic conductivity of the second material is between about  $10^{-6}$  S/cm and  $10^{-3}$  S/cm (claim 5 as applied to instant claims 5 and 6).

The ionic conductivity of the second material is between about  $10^5$  S/cm and  $10^4$  S/cm (claim 6 as applied to instant claims 6 and 7).

The thickness ratio of the first material to the second material in the composite is less than 1-1000 (claim 7 as applied to instant claims 9-11).

The active metal of the electrode is lithium (claim 8 as applied to instant claims 15-17).



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The first material is the composite reaction product of lithium metal with  $\text{Cu}_3\text{N}$  (claims 9 and 10 as applied to instant claims 25 and 30).

The second material is identical in scope (claim 14 as applied to instant claims 20 and 28).

The metal nitride is copper nitride (claim 21 as applied to claim 73).

The first material comprises a material selected from the group consisting of a reaction product of Li with LiPON coated with a wetting layer (claim 25 as applied to claim 77).

The wetting layer coating is Ag (claim 26 as applied to claim 78).

The wetting layer coating is Sn (claim 27 as applied to claim 79).

With respect to the thickness limitations of claims 8-14: generally, differences in ranges will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such ranges is critical. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969).

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

#### ***Allowable Subject Matter***

9. Claims 25 and 30 recite potentially allowable subject matter, pending clarification of the outstanding double patenting issues in this application and the related application discussed above. The elected species of the first material, composite reaction product of lithium metal with  $\text{Cu}_3\text{N}$  is neither taught nor reasonably suggested by the prior art of

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record. While Bates employs  $\text{Li}_3\text{N}$ , this layer is formed by reactive sputtering and not by a reaction product of lithium metal with  $\text{Cu}_3\text{N}$ . The reaction product of the instant claims appears to result in a composite  $\text{Li}_3\text{N}$ /copper metal first barrier material which is materially different from that of Bates.

### ***Conclusion***

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

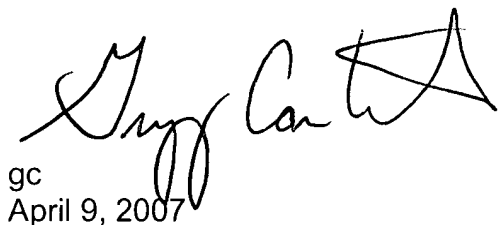
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is 571-272-1283. The examiner can normally be reached on Monday to Thursday, 8:00-5:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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gc  
April 9, 2007

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Art Unit 1745